

## PATENT ABSTRACTS OF JAPAN

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(21)Application number : 11-300843

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(72)Inventor : FUJIWARA TETSUO

(54) SOIL CONDITIONER

(57)Abstract:

PROBLEM TO BE SOLVED: To solve such conventional problems about the utilization of poultry manure as a soil conditioner or a fertilizer that, when poultry manure is spontaneously dried in the sun or forcibly dried by using a fuel, a malodor is emitted; the treating time is long; and the treating cost is high and that, when poultry manure is fermented, a harmful gas is generated by the fermentation.

SOLUTION: This soil conditioner comprises a main ingredient prepared by mixing poultry manure, calcium silicate and/or calcium carbonate, and conc. sulfuric acid and an auxiliary ingredient comprising powdered unpolished rice and an enzymatic decomposition residue of soy beans.

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DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Field of the Invention]It generates in large quantities in a poultry farm etc., and this invention relates to the soil conditioner using the chicken droppings troubled by that discarding treatment.

[0002]

[Description of the Prior Art]Conventionally, in the poultry farm etc., although chicken droppings occur in large quantities and are troubled by the processing, since many organic components required for crops are included, chicken droppings are used as a soil conditioner or manure. In order to use chicken droppings as a soil conditioner or manure, carry out natural seasoning according to sunlight, it is made to dry compulsorily by fuel use, or fermentation treatment is carried out further.

[0003]

[Problem(s) to be Solved by the Invention]However, it had the technical problem that carry out natural seasoning of the chicken droppings according to sunlight as it is although chicken droppings are used as a soil conditioner or manure, or an offensive odor occurs if it is made to dry compulsorily by fuel use, or a processing term was prolonged, or a processing cost cost dearly.

[0004]When carrying out fermentation treatment of the chicken droppings, since harmful gas was emitted by fermentation, the handling was difficult, and it had the technical problem that an offensive odor occurred like a drying process, a processing term was prolonged, or a processing cost cost dearly.

[0005]Then, without generating an offensive odor in solving the above-mentioned conventional technical problem and manufacturing, a processing term does not become long, either, but the processing cost of this invention is also cheap, and it is made for the purpose of providing the good soil conditioner as which remarkable growth of a standard plate count is moreover regarded.

[0006]

[Means for Solving the Problem]Therefore, a soil conditioner of this invention shall have become considering residue after brown rice and soybean zymolysis which used as the main ingredients what adds and mixes a calcium silicate and/or calcium carbonate, and concentrated sulfuric acid to chicken droppings, and powder-ized it as an accessory constituent.

[0007]A soil conditioner of this invention is good also as what becomes considering

residue and leaf mold after brown rice and soybean zymolysis which used as the main ingredients what adds and mixes a calcium silicate and/or calcium carbonate, and concentrated sulfuric acid to chicken droppings, and powder-ized it as an accessory constituent.

[0008]

[Embodiment of the Invention] Hereafter, the embodiment of the soil conditioner of this invention is described in detail.

[0009] The soil conditioner of this invention is manufactured as follows, although it shall consist of the main ingredients and the accessory constituent which were written in the column of The means for solving a technical problem.

[0010] In this invention, chicken droppings can collect as it is what was generated in large quantities, and it can be used for them in a poultry farm etc. A calcium silicate and calcium carbonate are used in order to granulate chicken droppings, and 10-20 weight-section addition is carried out to chicken-droppings 100 weight section. Concentrated sulfuric acid is used in order to react to the alkalinity in chicken droppings and to make it neutralize, and 3-15 weight-section addition is carried out to chicken-droppings 100 weight section.

[0011] That is, to chicken-droppings 100 weight section, ten to calcium silicate and/or calcium carbonate 20 weight section and three to concentrated-sulfuric-acid 15 weight are added, it mixes, this mixture is granulated, and it is considered as the main ingredients of the soil conditioner of this invention. It is more desirable to add concentrated sulfuric acid previously to remove an offensive odor effectively, although a calcium silicate and/or calcium carbonate, and concentrated sulfuric acid may add any first to chicken droppings or may add them simultaneously. After adding concentrated sulfuric acid to chicken droppings and fully mixing to them, when a calcium silicate and/or calcium carbonate are added and it mixes, viscous stickiness of chicken droppings is lost and is granulated. It powder-izes, applying these granulated chicken droppings to a powder machine.

[0012] It is not limited to what was carried out in this way although what carried out high temperature roast and powder-ized brown rice was used, and the brown rice powder-ized in this invention is \*\*\*\*\* for 1 - 3 weight sections to said main-ingredients 100 weight section. Immediately after fermenting a soybean in an aspergillus, zymolysis is carried out, the residue after carrying out extract extraction etc. are used, and the residue after soybean zymolysis is \*\*\*\*\* for 1 - 3 weight sections to said main-ingredients 100 weight section. Fallen leaves are deposited and decayed, it is used in order to improve breathability, water retention, and fertilizer retention, and leaf mold is \*\*\*\*\* for 1 weight sections to main-ingredients 100 weight section.

[0013] Namely. [ whether one to brown rice 3 powder-ized weight section and one to residue 3 weight section after soybean zymolysis are mixed to said main-ingredients 100 weight section, and ] the soil conditioner of this invention that was distributed by adding the accessory constituent which furthermore mixes leaf mold 1 weight section if needed in those main ingredients, and being mixed and that became and was powder-ized as a whole is manufactured. The soil conditioner of this invention can also pelletize with a tableting machine etc. what was powder-ized.

[0014] in addition -- although what adds and mixes a calcium silicate and/or calcium carbonate, and concentrated sulfuric acid to the chicken droppings which are the main

ingredients of the soil conditioner of this invention had the low growth value of the standard plate count in the measurement result shown below -- so much -- also coming out -- it can be somehow used as a soil conditioner.

[0015]

[Example]Next, the desirable example of the soil conditioner of this invention is given, and the result measured about growth of the standard plate count in that soil conditioner is shown.

(Examples 1-6) First, 5 g of calcium silicates, the calcium carbonate 5g, and the concentrated sulfuric acid 10g are added, it mixes, this mixture is granulated to 100 g of chicken droppings, and it is considered as the main ingredients of the soil conditioner of this invention. And to 100 g of these main ingredients, the residue and leaf mold after the brown rice and soybean zymolysis which were powder-ized were added, it mixed at a rate shown in the following table 1, and the soil conditioner of this invention was manufactured.

[0016]

[Table 1]

実施例	粉粒化した玄米	大豆酵素分解後の残渣	腐葉土
1	1 g	1 g	—
2	1 g	3 g	—
3	1 g	1 g	1 g
4	3 g	1 g	—
5	3 g	3 g	—
6	3 g	1 g	1 g

[0017]Next, 0.01g of soil conditioners of this invention shown in Table 1 were distributed to each petri dish, respectively, and it measured about the standard plate count after shaking at the same day and a 24-hour room temperature. As a comparative example, 0.01 g of main ingredients of the soil conditioner of this invention were taken on the petri dish, and it measured about the standard plate count similarly. A measurement result is shown in Table 2.

[0018]

[Table 2]

(単位：個／g)

	即日	24時間後
実施例 1	$1.8 \times 10^{11}$	$30.7 \times 10^{11}$
実施例 2	$1.8 \times 10^{11}$	$32.3 \times 10^{11}$
実施例 3	$2.2 \times 10^{11}$	$33.8 \times 10^{11}$
実施例 4	$2.7 \times 10^{11}$	$43.0 \times 10^{11}$
実施例 5	$2.8 \times 10^{11}$	$45.0 \times 10^{11}$
実施例 6	$3.5 \times 10^{11}$	$45.0 \times 10^{11}$
比較例	$4.0 \times 10^{10}$	$6.0 \times 10^{10}$

[0019]As a result of the above-mentioned measurement, to the comparative example, growth of number of microorganism with much single figure was seen, by culture, growth of number of microorganism with much double figure was seen for 24 hours, and the soil conditioner of this invention showed the value very desirable as a soil conditioner by culture also in which example on the same day.

[0020]

[Effect of the Invention]Without generating an offensive odor in manufacturing, since it was constituted as stated above, a processing term did not become long, either, but the processing cost was also cheap, moreover remarkable growth of the standard plate count in a soil conditioner was seen, and the soil conditioner of this invention became good.

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**CLAIMS**

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[Claim(s)]

[Claim 1]A soil conditioner becoming considering residue after brown rice and soybean zymolysis which used as the main ingredients what adds and mixes a calcium silicate and/or calcium carbonate, and concentrated sulfuric acid to chicken droppings, and powder-ized it as an accessory constituent.

[Claim 2]A soil conditioner becoming considering residue and leaf mold after brown rice and soybean zymolysis which used as the main ingredients what adds and mixes a calcium silicate and/or calcium carbonate, and concentrated sulfuric acid to chicken droppings, and powder-ized it as an accessory constituent.

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[Translation done.]

【解決手段】 鶏糞にケイ酸カルシウム及び／又は炭酸カルシウム、並びに濃硫酸を添加、混合してなるものを主成分とし、粉粒化した玄米と大豆酵素分解後の残渣を副成分としてなるものとしている。

**【特許請求の範囲】**

【請求項1】 鶏糞にケイ酸カルシウム及び／又は炭酸カルシウム、並びに濃硫酸を添加、混合してなるものを主成分とし、粉粒化した玄米と大豆酵素分解後の残渣を副成分としてなることを特徴とする土壤改良剤。

【請求項2】 鶏糞にケイ酸カルシウム及び／又は炭酸カルシウム、並びに濃硫酸を添加、混合してなるものを主成分とし、粉粒化した玄米と大豆酵素分解後の残渣と腐葉土を副成分としてなることを特徴とする土壤改良剤。

**【発明の詳細な説明】****【0001】**

【発明の属する技術分野】この発明は、養鶏場等で大量に発生し、その廃棄処理に困っている鶏糞を利用した土壤改良剤に関するものである。

**【0002】**

【従来の技術】従来、養鶏場等においては、鶏糞が大量に発生しその処理に困っているが、鶏糞は、作物に必要な有機成分を多く含んでいるので、土壤改良剤や肥料として利用されている。鶏糞を土壤改良剤や肥料として利用するには、天日によって自然乾燥させたり、燃料使用によって強制的に乾燥させたり、さらには発酵処理したりしている。

**【0003】**

【発明が解決しようとする課題】しかしながら、鶏糞を土壤改良剤や肥料として利用するのに、鶏糞をそのまま天日によって自然乾燥させたり、燃料使用によって強制的に乾燥させるのでは、悪臭が発生したり、処理期間が長引いたり、処理費用が高くつくという課題を有していた。

【0004】また、鶏糞を発酵処理する場合には、発酵によって有害ガスが発生したりすることもあり、その取り扱いが困難であると共に、乾燥処理と同様に悪臭が発生したり、処理期間が長引いたり、処理費用が高くつくという課題を有していた。

【0005】そこで、この発明は、上記従来の課題を解決するものであり、製造するに当たり、悪臭が発生することなく、処理期間も長くならず、処理費用も安く、しかも一般生菌数の顕著な増殖が見られる良質な土壤改良剤を提供することを目的としてなされたものである。

**【0006】**

【課題を解決するための手段】そのため、この発明の土壤改良剤は、鶏糞にケイ酸カルシウム及び／又は炭酸カルシウム、並びに濃硫酸を添加、混合してなるものを主成分とし、粉粒化した玄米と大豆酵素分解後の残渣を副成分としてなるものとしている。

【0007】さらに、この発明の土壤改良剤は、鶏糞にケイ酸カルシウム及び／又は炭酸カルシウム、並びに濃硫酸を添加、混合してなるものを主成分とし、粉粒化した玄米と大豆酵素分解後の残渣と腐葉土を副成分として

なるものとしてもよい。

**【0008】**

【発明の実施の形態】以下、この発明の土壤改良剤の実施の形態について、詳細に説明する。

【0009】この発明の土壤改良剤は、課題を解決するための手段の欄に記載した主成分と副成分からなるものとしているが、次のようにして製造される。

【0010】この発明において、鶏糞は、養鶏場等で大量に発生したものをそのまま回収して用いることができる。ケイ酸カルシウムや炭酸カルシウムは、鶏糞を粒状化するために用いられるものであり、鶏糞100重量部に対して10～20重量部添加される。さらに、濃硫酸は、鶏糞中のアルカリ分と反応し中和させるために用いられるものであり、鶏糞100重量部に対して3～15重量部添加される。

【0011】すなわち、鶏糞100重量部に対し、ケイ酸カルシウム及び／又は炭酸カルシウム10～20重量部、並びに濃硫酸3～15重量部を添加、混合し、この混合物を粒状化し、この発明の土壤改良剤の主成分としている。ケイ酸カルシウム及び／又は炭酸カルシウムと濃硫酸は、鶏糞に何れを先に添加しても、同時に添加してもよいが、悪臭を効果的に除去するには濃硫酸を先に添加するほうが好ましい。鶏糞に濃硫酸を添加し十分に混合した後、ケイ酸カルシウム及び／又は炭酸カルシウムを添加、混合すると、鶏糞の粘稠べたつきはなくなり、団粒化される。さらに、この団粒化された鶏糞を粉粒機にかけるなどして、粉粒化する。

【0012】この発明において、粉粒化した玄米は、玄米を高温焙煎して粉粒化したものを用いたが、このようにしたものに限定されるものではなく、前記主成分100重量部に対して1～3重量部用いられる。また、大豆酵素分解後の残渣は、大豆を麹菌で発酵させた後、直ちに酵素分解させ、エキス抽出した後の残渣などが用いられ、前記主成分100重量部に対して1～3重量部用いられる。さらに、腐葉土は、落ち葉を堆積して腐らせたものであり、通気性、保水性、保肥性を高めるために用いられ、主成分100重量部に対して1重量部用いられる。

【0013】すなわち、前記主成分100重量部に対し、粉粒化した玄米1～3重量部と大豆酵素分解後の残渣1～3重量部を混合してなるか、さらに必要に応じて腐葉土1重量部を混合してなる副成分は、その主成分中に添加、混合されることにより分散したものになって、全体として粉粒化されたこの発明の土壤改良剤が製造される。また、この発明の土壤改良剤は、粉粒化されたものを打錠機などによってペレット化することもできる。

【0014】なお、この発明の土壤改良剤の主成分である、鶏糞にケイ酸カルシウム及び／又は炭酸カルシウム、並びに濃硫酸を添加、混合してなるものは、以下に示す測定結果では一般生菌数の増殖値が低かったが、そ



れだけでも土壌改良剤として使用できないこともない。

【0015】

【実施例】次に、この発明の土壌改良剤の好ましい実施例を挙げ、その土壌改良剤中の一般生菌数の増殖について測定した結果を示す。

(実施例1～6) 先ず、鶏糞100gに対し、ケイ酸カルシウム5g、炭酸カルシウム5g及び濃硫酸10gを\*

\*添加、混合し、この混合物を粒状化し、この発明の土壌改良剤の主成分とする。そして、この主成分100gに対し、以下の表1に示す割合で粉粒化した玄米、大豆酵素分解後の残渣及び腐葉土を添加、混合し、この発明の土壌改良剤を製造した。

【0016】

【表1】

実施例	粉粒化した玄米	大豆酵素分解後の残渣	腐葉土
1	1 g	1 g	—
2	1 g	3 g	—
3	1 g	1 g	1 g
4	3 g	1 g	—
5	3 g	3 g	—
6	3 g	1 g	1 g

【0017】次に、表1に示したこの発明の土壌改良剤をそれぞれ0.01gずつシャーレに分配し、即日及び24時間室温にて振とうした後の一般生菌数について測定した。なお、比較例として、この発明の土壌改良剤の※

※主成分0.01gをシャーレに採り、同様に一般生菌数について測定した。測定結果を表2に示す。

【0018】

【表2】

(単位:個/g)

	即日	24時間後
実施例1	1.8 × 10 <sup>11</sup>	30.7 × 10 <sup>11</sup>
実施例2	1.8 × 10 <sup>11</sup>	32.3 × 10 <sup>11</sup>
実施例3	2.2 × 10 <sup>11</sup>	33.8 × 10 <sup>11</sup>
実施例4	2.7 × 10 <sup>11</sup>	43.0 × 10 <sup>11</sup>
実施例5	2.8 × 10 <sup>11</sup>	45.0 × 10 <sup>11</sup>
実施例6	3.5 × 10 <sup>11</sup>	45.0 × 10 <sup>11</sup>
比較例	4.0 × 10 <sup>10</sup>	6.0 × 10 <sup>10</sup>

【0019】上記測定の結果、この発明の土壌改良剤は、何れの実施例においても、比較例に対し、即日培養では一桁多い菌数の増殖が見られ、24時間培養では二桁多い菌数の増殖が見られ、土壌改良剤として非常に好ましい値を示した。

【0020】

★

★【発明の効果】この発明の土壌改良剤は、以上に述べたように構成されているので、製造するに当たり、悪臭を発生することなく、処理期間も長くならず、処理費用も安く、しかも土壌改良剤中の一般生菌数の顕著な増殖が見られ良質なものとなった。

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**TITLE:** SOIL CONDITIONER  
**PUBN-DATE:** April 24, 2001

**INVENTOR-INFORMATION:**

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FUJIWARA, TETSUO	N/A

**ASSIGNEE-INFORMATION:**

<b>NAME</b>	<b>COUNTRY</b>
TOYO SHOJI KK	N/A

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**INT-CL (IPC):** C09K017/42 , C05D003/02 ,  
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C05F005/00 , C05F011/00 ,  
C05G001/00 , C09K017/06 ,  
C09K017/12 , C09K017/32 ,  
C09K017/46

**ABSTRACT:**

PROBLEM TO BE SOLVED: To solve such conventional problems about the utilization of poultry manure as a soil conditioner or a fertilizer that, when poultry manure is spontaneously dried in the sun or forcibly dried

by using a fuel, a malodor is emitted; the treating time is long; and the treating cost is high and that, when poultry manure is fermented, a harmful gas is generated by the fermentation.

SOLUTION: This soil conditioner comprises a main ingredient prepared by mixing poultry manure, calcium silicate and/or calcium carbonate, and conc. sulfuric acid and an auxiliary ingredient comprising powdered unpolished rice and an enzymatic decomposition residue of soy beans.

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**DERWENT-ACC-NO:** 2001-459917**DERWENT-WEEK:** 200150*COPYRIGHT 2008 DERWENT INFORMATION LTD*

**TITLE:** Soil conditioner comprises hen droppings with calcium silicate and/or carbonate, sulfuric acid as principal components, and unpolished rice, decomposed product of soybean and humus as accessory constituents

**INVENTOR:** FUJIWARA T**PATENT-ASSIGNEE:** TOYO SHOJI KK[TOYI]**PRIORITY-DATA:** 1999JP-300843 (October 22, 1999)**PATENT-FAMILY:**

<b>PUB-NO</b>	<b>PUB-DATE</b>	<b>LANGUAGE</b>
JP 2001115160 A	April 24, 2001	JA

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JP2001115160A	N/A	1999JP- 300843	October 22, 1999

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CIPP	C09K17/42 20060101
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CIPS	C09K17/32 20060101
CIPS	C09K17/46 20060101
CIPN	C09K101/00 20060101

**ABSTRACTED-PUB-NO:** JP 2001115160 A

**BASIC-ABSTRACT:**

NOVELTY - A soil conditioner comprises calcium silicate and/or carbonate and concentrated sulfuric acid mixed to hen droppings as principal components. The conditioner comprises unpolished rice, decomposed product of soybean and humus as accessory constituents.

USE - As soil conditioner.

ADVANTAGE - The soil conditioner is prepared using droppings of hens from poultry farming. The soil conditioner can be manufactured in a short period, cheaply with remarkable number of live microbes.

**TITLE-TERMS:** SOIL CONDITION COMPRISE HEN DROPPINGS  
CALCIUM SILICATE CARBONATE ACID  
PRINCIPAL COMPONENT UNPOLISHED RICE  
DECOMPOSE PRODUCT SOY HUMUS ACCESSORY  
CONSTITUENT

**DERWENT-CLASS:** C04

**CPI-CODES:** C04-B04B2; C05-A01B; C05-B02C; C05-C04; C05-C05; C14-T01;

**CHEMICAL-CODES:** Chemical Indexing M1 \*04\*  
Fragmentation Code M423 M430 M782  
P126 Specific Compounds RA00GT  
Registry Numbers 200757 200799

Chemical Indexing M2 \*01\*  
Fragmentation Code M430 M782 P126  
Specific Compounds RA0PFS Registry  
Numbers 89849

Chemical Indexing M2 \*02\*  
Fragmentation Code A220 A940 C106  
C108 C530 C730 C801 C802 C803 C805  
C807 M411 M430 M782 P126 Specific  
Compounds R01278 R05243 Registry  
Numbers 89827

Chemical Indexing M2 \*03\*  
Fragmentation Code C101 C108 C316  
C540 C730 C800 C801 C802 C804 C805  
M411 M430 M782 P126 Specific  
Compounds R01714 R07673 Registry  
Numbers 7

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